

## ACRYLAMIDE - EU Summary of Activities

## STUDY AREA 3 - WAYS TO REDUCE LEVELS OF ACRYLAMIDE IN FOOD

NEW/UPDATE since February 2005

Entry No.	STUDY TITLE	SOURCE  (Member State/ Organisation)	STATUS  C (completed) O (ongoing) P (proposed)	COMPLETION DATE  (anticipated date if not yet completed)	SUMMARY OF AIMS OF STUDY  Max 50 words	SUMMARY OF MAIN CONCLUSIONS  Max 50 words	COMMENTS	REFERENCES/ INTERNET LINKS	CONTACTS
3.1	Acrylamide in potato products	Belgium / Belgian Association of Potato Processors and Ghent University	O	October 2003	The objective of this study is to assess levels of acrylamide in potato products. Industry processed, home prepared and semi-prepared products are included in this study. Factors studied are the effect of raw materials and processing conditions in order to reduce acrylamide levels.				Prof. A. Huyghebaert, Dept. Food Technology and Nutrition, tel +32 9 264 61 62, Fax +32 9 264 62 18; Andre.Huyghebaert@rug.ac.be; Romain Cools, Belgapom, Tel +32 9 339 12 52, Fax 32 9 339 12 51; Romain@fvphouse.be
3.2	The influence of the composition of model systems & foodstuffs on acrylamide formation	Belgium / Ghent University, collaboration between the laboratory of bioanalysis (Faculty of Farmaceutical Sciences) and the laboratory of Food Chemistry and Analysis (Faculty of Biological and Applied Biological Sciences)	O	October 2007	This study contains 4 aims: 1. To validate a procedure for the analysis of acrylamide in relevant food matrices 2. To study the formation of acrylamide in model systems 3. To study the formation of acrylamide in foods 4. To evaluate strategies to decrease or to avoid acrylamide formation		Besides an investigation using model systems, potato and wheat products will be the main foodstuffs under study	<a href="http://www.foodchem.ugent.be">http://www.foodchem.ugent.be</a> <a href="http://www.foodanal.ugent.be">http://www.foodanal.ugent.be</a>	Carlos Van Peteghem & Bruno De Meulenaer (Promoters) & Frédéric Mestdagh (PhD-student) Ghent University Coupure Links 653 B-9000 Ghent Belgium Tel ++ 32 9 264 61 66 Fax ++ 32 9 264 62 18 Bruno.Demeulenaer@UGent.be Frederic.Mestdagh@UGent.be

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3.3	Agricultural and industrial proces parameters which cause variability in acrylamide formation during frying of potatoes and chips.	Belgium / Ghent University, Laboratory of Food Chemistry, Department of Food Safety and Food Quality, in collaboration with the Institute of Public Health (J.M. Degroodt, Y.Govaert), Provincial Centre for Potato Breeding (Dr. Calus), Laboratory of bioanalysis (W.Ooghe, C. Van Peteghem)	O	December 2005	This study contains 2 aims: 1. To study the formation of acrylamide in different potato varieties, grown and stored under different conditions 2. To compare the acrylamide formation between two consecutive storage seasons (same potato varieties) 3. To test the influence of different proces parameters on acrylamide formation			<a href="http://www.foodchem.ugent.be">http://www.foodchem.ugent.be</a> <a href="http://www.proefcentrum-kruishoutem.be/PCAI/index.htm">http://www.proefcentrum-kruishoutem.be/PCAI/index.htm</a>	Bruno De Meulenaer Ghent University Department of Food Safety and Food Quality, Coupure Links 653 B-9000 Ghent Belgium Tel ++ 32 9 264 61 66 Fax ++ 32 9 264 62 18 Bruno.DeMeulenaer@UGent.be
3.4	Reduction of Acrylamide Formation in Potato Slices During Frying.	Denmark / Danish Veterinary and Food Administration	C	2004	To study the reduction of acrylamide in potato slivces when e.g. blanching	Blanching reduced on average 76% and 68% of glucose and asparagine compared to control. Highest acrylamide reduction when blanching at 50C for 70 min.		Pedreschi F, Kaack K. and Granby K. 2004.Food Science and Technology 37 , 6, 679-685	<a href="mailto:kgr@dfvf.dk">kgr@dfvf.dk</a>

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3.5	Reduction of formation and occurrence of acrylamide in food	Denmark / Danish Vet. and Food Administration/ The Centre for Advanced Food Studies/ 5 Food Industries	O	October 2002-December 2005	To investigate how to reduce acrylamide in bread, potato products and cereals.	results to be published later	Results published after accept by project participants.	www.fdir.dk	Kit Granby, E-mail kgr@dfvf.dk. Phone +45 33 95 64 74, Institute of Food Safety and Nutrition
3.6	Influence of flavonoid spices on the formation of acrylamide during frying of potato products.	Finland / University of Helsinki, SKL-Companies	C	December 2002	To study if addition of flavonoid spices could reduce or prevent the formation of acrylamide in foodstuffs made in heated fat.	In this study the amount of acrylamide was clearly reduced when a flavonoid spice was applied.		www.selako.com	Lasse Kurppa, lasse.kurppa@selako.com, fax: +358-9-632067, tel: +358-9-6962170, mobile: +358-500 459726, address: Box 105, 00131 HELSINKI, FINLAND
3.7	The formation of acrylamide during frying of potato chips could be decreased and perhaps prevented through addition of the flavonoid spice, Flavomare®	Finland / University of Helsinki, SKL-Companies	C	December 2002	Can Flavomare spice reduce or prevent the formation of acrylamide in foodstuffs made in heated fat.	In this study the amount of acrylamide was clearly reduced when flavonoid spice, Flavomare®, was applied.		www.selako.com, soon available	Lasse Kurppa, lasse.kurppa@selako.com, fax: +358-9-632067, tel: +358-9-6962170, mobile: +358-500 459726, address: Box 105, 00131 HELSINKI, FINLAND

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3.8	Influence of the raw material (potato variety and field site) on the formation of acrylamide	Germany / Federal Research Centre for Nutrition and Food	O	July 2006	To find out the influence of acrylamide formation in deep fat fried potato products, derived from different potato varieties, grown at different field sites; to find out how much the acrylamide formation depends on type and time of storage.	Potato chips (french fries) and potato crisps (chips) are produced in a semi-technical processing line. The influence of different varieties, grown at different field sites is to be detected. Furthermore the influence of different storage regimes (temperature) will be determined.	-	Haase, N.U. and L. Weber: Variability of sugar content in potato varieties suitable for processing. Journal of Food, Agriculture and Environment (JFAE) 1, (2003), 80-81	Dr. Haase, Federal Research Centre for Nutrition and Food, Detmold, Tel.: +49-(0)5231-741-453, Fax: ...-100; e-mail: potato@bagkf.de; Dr. Matthäus, Federal Research Centre for Nutrition and Food, Münster, Tel: +49-(0)251 48167-14 E-mail: matthaus@uni-muenster.de
3.9	Acrylamide formation in potato products	see 3.8	O	July 2006	To find out, how much a leaching step can reduce formation of acrylamide; to find out how much a modified temperature profile can reduce the formation of acrylamide.	A water leaching step within processing of crisps (chips) will reduce levels of sugars and amino acids, but texture quality will be reduced too. Temperature has a major influence upon formation of acrylamide. Extreme temperature profiles have adverse effects on the quality. In both cases optimum strategies must be identified.	-	Haase, N.U., B. Matthäus und K. Vosmann: Zum Vorkommen von Acrylamid in Kartoffelerzeugnissen. Obst- Gemüse- und Kartoffelverarbeitung 88 (2003), 16-19	see 3.8

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3.10	Optimisation of preparation to reduce levels of acrylamide within potato chips (french fries)	see 3.8	O	July 2005	To find out, how much a modified guideline for preparation will reduce formation of acrylamide; home made and restaurants, both. to find out how much a modified temperature profile can reduce the formation of acrylamide.	Par fried potato chips (french fries) have to be end fried before consumption. Two techniques are present, deep fat fryers and ovens. Both ways of preparation have to be investigated.	-	see 3.8	see 3.8
3.11	Acrylamide formation in cereal products	see 3.8	O	July 2005	To find out how much acrylamide is present in main cereal products (bakery and fine bakery products, extrusion products and breakfast cereals); to find out the influence of different flours and ingredients.	Cereal products cover a wide range of final products. Typical products are selected, to observe the influences of wheat and rye flour and of several ingredients like sugars.	-	-	see 3.8
3.12	Identification of relevant components of biscuits with view to formation of acrylamide	see 3.8	O	July 2005	To find out, which constituents of biscuits are relevant for formation of acrylamide; to develop strategies for minimising the formation of acrylamide	A dough represents a complex system. Several ingredients may influence the final concentration of relevant components for formation of acrylamide. A multiple step investigation with biscuits shall identify most relevant components. After that minimising strategies have to be developed and proofed.	-	-	see 3.8

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3.13	Influence of different vegetable oils and additives on the acrylamid levels in deep-fat fried potatoes	see 3.8	C	December 2003	To find out if the formation of acrylamide in deep-fat fried potatoes is influenced by the sort of oil and/or by the utilization of additives such as silicon.	During deep-fat frying the oil acts as transfer medium for the heat. In this connection it could be possible that different oils have an different ability to transfer the heat to the food. Additionally it could be possible that additives, used to improve the quality and the life of the oil change the heat transfer and therefore the formation of acrylamide.	-	Matthäus et al., Eur. J. Lipid Sci. Technol. 106 (2004), 793-801	see 3.8
3.14	Reduction of reducing sugars in storage potatoes	Germany / UNIKA	O	open	Reduction of reducing sugars in storage potatoes by means of site selection, plant feeding, choice of variety and storing conditions	open	-	-	Mr. von Campenhausen, info@kartoffelwirtschaft.de, +49-30/31904-415 (tel), -416 (fax), Reinhardtstrasse 18, D - 10117 Berlin

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3.15	Sub-project of the ZUTECH - Cooperation-Project (see also study areas 1, 4 and 6)	Germany / Bund für Lebensmittelrecht und Lebensmittelkunde e.V. (BLL), Institute for Food-Environmental Research, German Institute for Food Technology and the Federal Institute for Grain, Potato and Fat Research	P	end 2004 - early 2005	Description of acrylamid formation in food matrices at process conditions; Definition of the process parameters to minimize acrylamid; Definition of requirements for raw materials, ingredients and additives, Definition of requirements for production facilities		See also study areas 1, 4 and 6.	<a href="http://www.bll-online.de">www.bll-online.de</a>	<a href="mailto:jgelbert@bll-online.de">jgelbert@bll-online.de</a>
3.16	„Development of new technologies to avoid acrylamide in food“ (ZUTECH-Cooperation Project; AiF-FV 108 ZBG)	Germany / Bund für Lebensmittel-recht und Lebensmittel-kunde e.V. (BLL)	O	March 2005	Investigation of mechanism of acrylamide generation in food matrices; Definition of process parameters for reducing acrylamide; Definition of requirements for raw materials, ingredients and additives, for machines and equipment for operation to minimize acrylamide; Investigated products: baked goods, breakfast cereals, fried potato, crisps, oil for frying process;	First preliminary results: - reduction of acrylamide in crisp bread, influence of baking additives and sugars, processing time, temperature; - distribution of acrylamide between product matrix and frying fat; - reduction of acrylamide by pre-drying of par-fried French Fries and shorter frying time; - water leaching steps;	See also study areas 1.18; 4.4; 6.5; 7.2; 9.16	<a href="http://www.ilu-ev.de">http://www.ilu-ev.de</a>	<a href="mailto:jgelbert@bll-online.de">Jgelbert@bll-online.de</a>

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3.17	Measure and control of mycotoxins, pesticides and acrylamid in grain milling sector (MAP-Milling)	Germany / European Commission, 6. Framework Programme on Research, Technological Development and Demonstration	P		minimizing of acrylamid by reducing the free asparagine in grain and flour by investigate specific milling technologies and choosing cereal species with low content of asparagine			Acrylamide formation in baking goods; Getreide, Mehl und Brot, submitted	Dr. Tietz, Dr. Springer, IGV GmbH 14482 Bergholz Rehbrücke A. Scheunert Allee 40/41, Germany
3.18	Acrylamide levels in processed potato products	Norway / The food alliance (MATFORSK, Agricultural University of Norway), Federation of Norwegian Food and Drink Industry (NBL).	O	June 2003	To investigate the formation of acrylamide in deep fried potato products affected by the raw materials as well as the processing conditions (temperature time). To determine how prepossessing such as blanching, enzymic treatment influence the formation.	An increased formation of acrylamide was detected when increasing the temperature and the frying time. For some potato sources a reduced formation was induced upon blanching, but apparently no simple connection is found. The constituents in the raw materials are very essential.	Simultaneously analyses are carried out to determine key components such as low molecular weight carbohydrates and amino acids.	www.matforsk.no/	svein.knutsen@matforsk.no, fax +47 64970333, and trude.wicklund@inf.nlh.no



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3.19	Acrylamide levels in processed cereal products.	Norway / The food alliance (MATFORSK, Agricultural University of Norway), Federation of Norwegian Food and Drink Industry (NBL).	O	June 2003	To investigate typical norwegian cereal products such as bread (fine wheat, coarse wheat/rye mixtures and coarse rye types) and crisp breads (rye based) processed in a well defined pilot plant bakery. The effect of time, temperature and added ingredients (enzymes, sugars and amino acids) are studied.	The significant part of the acrylamid formed was detected in the crust. No significant differences were detected between the different cereal sources, but bread baked in closed containers had lower values. For crisp bread acrylamide level increased dramatically by heating- and baking time . For bread (crust) no dramatic rise in acrylamide was detected by increasing the level of reducing sugars (enzymes) but an increased content of asparagine gave rise to elevated values.	Crisp bread is considered as a good model products. It is possible to produce sensoric acceptable products by different temperatures and times for baking.	www.matforsk.no/	svein.knutsen@matforsk.no, fax +47 64970333, and trude.wicklund@inf.nlh.no

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3.20	Acrylamide in processed food products, optimization of processes.	Norway / Norwegian Research Council, MATFORSK, NLH, NBL, NILU.	O	December 2006	To investigate the effect of processing conditions and possible ways to reduce the content by adjusting those on a specific raw material. Determining if the proposed processing changes gives consumer acceptable products. Determine analytical methods for monitoring key components for the formation.	The level of acrylamide in a starch based model system and dry cereal products went through a maximum at approximately 180-210 degrees C, irrespective of the levels of asparagine and glucose present in the model system. The amount of acrylamide decreased with baking time. In bread crust an increase with both time and temperature was found. Acrylamide content in air under domestic preparation and industrial preparation of foods has been measured. Only tiny amounts found, not likely to pose a health risk.	The project was started in January 2003. In 2004 contact with HEATOX was established through participation in its External Consulting Panel.	www.matforsk.no/	erland.braathen@matforsk.no, andres.tromborg@matforsk.no, tlf ++47 64970100, fax++47 64970333
3.21	Acrylamide – Precursors; Limiting substrates and in vivo effects	Norway / Matforsk. An application to Nordic Industrial Fund will be filed. It will include researchers and industry in Norway, Sweden and Denmark	P	Dec-06	The Overall aim of the project is to find the limiting substrate(s) in raw materials used for frying and baking (in order to reduce the content of acrylamide formed during processing), and to reveal possible effects of reducing them on health risks. We intend to link activities going on in the Nordic countries, and to ensure the spread of knowledge to all stakeholders.			http://matforsk.no	svein.knutsen@matforsk.no, andres.tromborg@matforsk.no, tlf ++4764970100, (fax: 0333)

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3.22	How to decrease the acrylamide levels in potato products - advice to the home cooking	Sweden / The Swedish National Food Administration	C	January 2003	To find out the importance of temperature, time and other parameters in the formation of acrylamide	Oven baked potato boats: AA formation strongly correlated to sugar content of potato. Tenfold AA increase with baking time/temperature within culinary acceptable range. Pre-treatment by blanching (90°C, 4min) or soaking (amb. temp., 2h) gave 10% and 20% reduction, respectively.			Ass. Prof. Lillianne Abramsson-Zetterberg, e-mail: liab@slv.se
3.23	Storage of potatoes	Switzerland / Official Food Control Authority of the Canton of Zurich	C	March 2003	Storage at temperatures of around 4 °C strongly increases potential of AA formation	For frying and roasting, gastronomy and households must be provided with potatoes stored at higher temperatures		Mitteilungen aus Lebensmitteluntersuchung und Hygiene 94 (2003) 167-180	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch
3.24	Optimized preparation of French fries	Switzerland / Official Food Control Authority of the Canton of Zurich	C	June 2003	Optimization of pretreatment and end frying for culinary quality and low AA content; collaboration with professional cooks	French fries of high culinary quality with less than 100 ppb AA		Eur. Food Res. Technol. 217 (2003) 185-194	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch

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3.25	Maximum content of reducing sugars in potatoes for frying and roasting	Switzerland / Official Food Control Authority of the Canton of Zurich	C	June 2003	Influence of the reducing sugars in raw potato used for baking and roasting on AA formation	Potatoes sold for roasting and frying should contain less than 1 g/kg fresh weight reducing sugar		Eur. Food Res. Technol. 217 (2003) 369 – 373	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch
3.26	Citric acid to reduce AA formation in French fries	Switzerland / Official Food Control Authority of the Canton of Zurich	C	September 2003	Verification of the effect of reducing the pH in the potato sticks on AA formation during frying	Reduction by factor 2-3 with 0.75 % citric acid in the bleaching water		Mitteilungen aus Lebensmitteluntersuchung und Hygiene 95 (2004) 110-117	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch
3.27	Campaign in the gastronomy to reduce AA in French fries	Switzerland / Official Food Control Authority of the Canton of Zurich	C	December 2003	Gastronomy of Zurich area invited to produce French fries of good quality and low AA content; test on feasibility in practice	Median of AA content in 157 samples from restaurants: 76 ppb; 92 % of samples from frozen prefabricates below 150 ppb		Mitteilungen aus Lebensmitteluntersuchung und Hygiene 95 (2004) 127-134	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch
3.28	Brown potato croquettes low in AA	Switzerland / Official Food Control Authority of the Canton of Zurich	C	January 2004	Use of milk powder (lactose) increases AA formation; egg does not.	Coating with egg/breadcrumbs provides browning and reduces AA formation in the core		Eur. Food Res. Technol. 219 (2004) 111-115	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch

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3.29	More AA in French fries from "fresh" prefabricates	Switzerland / Official Food Control Authority of the Canton of Zurich	C	March 2004	French fries from fresh prefabricates cooled for up to 20 days with about doubled AA content	Blanching and pre-frying does not fully inactivate enzymes liberating sugar		Eur. Food Res. Technol. (in press)	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch
3.30	Less AA in French fries by restricting sugars and frying temperature	Switzerland / Official Food Control Authority of the Canton of Zurich	C	August 2004	Low sugars provide French fries low in AA even when overfried	Average AA content can be reduced to 50 ppb by limiting reducing sugars to 0.7 g/kg and initial oil temperature to 170 °C		Eur. Food Res. Technol. (in press)	Koni Grob, +41 43 244 71 31, Konrad.Grob@klzh.ch
3.31	Acrylamide in gingerbread	Switzerland / ETH Zurich	O	February 2004	Influence of ingredients (leavening agents in particular) and process conditions on acrylamide formation in gingerbread				<a href="mailto:thomas.amrein@ilw.agrl.ethz.ch">thomas.amrein@ilw.agrl.ethz.ch</a>
3.32	Acrylamide in roasted almonds	Switzerland / ETH Zurich	O	May 2004	Influence of process conditions on acrylamide formation in almonds during roasting				<a href="mailto:felix.escher@ilw.agrl.ethz.ch">felix.escher@ilw.agrl.ethz.ch</a>

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3.33	Feasibility study: Formation of acrylamide during processing of potatoes	The Netherlands			A feasibility study has been carried out to investigate formation of acrylamide during processing of potatoes into these products. Both products were studied by use of a factor analysis. These studies were followed by investigation of the effect of frying conditions time and temperature on acrylamide content. This study showed that the following factors are important: frying conditions, sugar content, blanching conditions, size.	A relation has been found between acrylamide content and frying conditions and glucose content just before frying. This relation is only slightly improved if asparagine content is added to it. Overall, it seems that asparagine content is not a limiting factor in formation of acrylamide. Frying temperature and glucose content are limiting. The results show that acrylamide content in chips and French fries can be reduced by selecting properly stored potatoes, using and optimising blanching conditions and using lower frying temperature.			

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3.34	Exploiting process factors to reduce acrylamide in cereal-based foods. (see also study area 4)	United Kingdom / UK Food Standards Agency/RHM Technology Ltd/Brewing Research International	O	Jun-05	To identify potential precursors in food and investigate the relationship between process factors and the formation of acrylamide, with a view to identifying methods to reduce levels in cereal-based food.		The project is being carried out by RHM and BRI on behalf of the Food Standards Agency. As in study area 4.	<a href="http://www.foodstandards.gov.uk">http://www.foodstandards.gov.uk</a> ; <a href="http://www.brewingresearch.co.uk">http://www.brewingresearch.co.uk</a> ; <a href="http://www.rhmtech.co.uk">http://www.rhmtech.co.uk</a>	David Flynn, e-mail: "Dr D S Flynn" <david.s.flynn@lineone.net>; Wendy Matthews, e-mail: Wendy.Matthews@foodstandards.gsi.gov; Colin Hamlet, e-mail: cghamlet@rhmtech.co.uk; Denise Baxter, e-mail: "Denise Baxter" <d.baxter@brewingresearch.co.uk>
3.35	Evaluation of the influence of potato variety and processing conditions on the generation of acrylamide in fried potato crisps.	United Kingdom	O	30-Nov	To investigate the factors of importance to acrylamide levels in potato crisps and to propose practical methods to reduce acrylamide.			<a href="http://www.campden.co.uk">www.campden.co.uk</a>	Dr James Williams, CCFRA, j.williams@campden.co.uk
3.36	Acrylamide in Potato and Cereal Products	United Kingdom / Universities of Reading, Leeds and Nottingham	O	Mar-05	In potato and cereal products, to define the parameters that control acrylamide formation, and other quality changes (e.g., colour, flavour, texture) in order to provide route(s) to minimise acrylamide formation whilst maintaining the desirable attributes		Sponsored by a consortium of seven companies		D S Mottram University of Reading Tel: +44(0)118 3786519 d.s.mottram@rdg.ac.uk

## ACRYLAMIDE - EU Summary of Activities

## STUDY AREA 3 - WAYS TO REDUCE LEVELS OF ACRYLAMIDE IN FOOD

NEW/UPDATE since February 2005

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3.37	Mechanism of the formation of acrylamide in cooked foods and factors affecting its formation during thermal processing (see also study area 4)	United Kingdom	P	March 2006	To identify the mechanism of formation of acrylamide in cooked foods, with the aim of recommending possible means of controlling acrylamide formation			<a href="http://www.food.gov.uk">www.food.gov.uk</a>	Dr Karen Goonan, Food Standards Agency karen.goonan@foodstandards.gsi.gov.uk
3.38	The effect of domestic cooking on acrylamide levels in food (see also study area 4)	United Kingdom	O	May-05	The study will examine typical situations of domestic food preparation and cooking within the home, with respect to acrylamide formation.			<a href="http://www.food.gov.uk/science/research/researchinfo/contaminantsresearch/mycotoxins/c03bprogramme/acrylamideresearch/c03037/">http://www.food.gov.uk/science/research/researchinfo/contaminantsresearch/mycotoxins/c03bprogramme/acrylamideresearch/c03037/</a>	Dr Karen Goonan, Food Standards Agency karen.goonan@foodstandards.gsi.gov.uk
3.39	Genetic and Agronomic approaches to reducing acrylamide formation in food derived from potato and cereals	United Kingdom	O	Oct-07	The aim of this project is to use genetic and agronomic methods to modify the levels of asparagine, amino acids in general, the ratio of asparagine to other amino acids and sugars in potato tubers and cereal grain.		Jointly funded project with BBSRC.	<a href="http://www.food.gov.uk">www.food.gov.uk</a>	Dr Karen Goonan, Food Standards Agency karen.goonan@foodstandards.gsi.gov.uk



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3.40	New and improved processing technologies minimising the formation of hazardous compounds	The HEATOX project	O	October 2006	To limit the formation of acrylamide, while ensuring product quality from safety, nutritional and sensory points of view		STREP under FP6 supported by EC, DGResearch, Priority on Food Quality and Safety	<a href="http://www.heatox.org">www.heatox.org</a>	<a href="http://www.heatox.org">www.heatox.org</a>